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(54) CALCIUM OXIDE COMPOSITION AND PRODUCTION OF SLAKED LIME

(57)Abstract:

PROBLEM TO BE SOLVED: To inexpensively produce slaked lime suitable for a filler, etc., of plastic, excellent in dispersibility and fluidity and having a low specific surface area.

SOLUTION: In a production method of slaked lime, calcium oxide is slaked in the presence of either monocarboxylic acid, amino acid, hydroxide and/or carbonate of an alkali metal and/or an alkaline earth metal and saccharose. The calcium oxide composition for a starting material of the slaked lime contg. the additives in the calcium oxide may be slaked.

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CLAIMS

[Claim(s)]

[Claim 1] The calcined-lime constituent characterized by containing a monocarboxylic acid.

[Claim 2] The calcined-lime constituent characterized by containing amino acid.

[Claim 3] The calcined-lime constituent characterized by containing the hydroxide and/or carbonate of alkali metal and/or alkaline earth metal.

[Claim 4] The calcined-lime constituent characterized by containing a saccharose.

[Claim 5] The manufacturing method of the slaked lime characterized by digesting calcined lime under one or more sorts of existence chosen from the group which consists of the hydroxide of a monocarboxylic acid, amino acid, alkali metal, and/or alkaline earth metal and/or a carbonate, or a saccharose.

[Claim 6] The manufacturing method of the slaked lime according to claim 5 characterized by digesting a claim 1, a claim 2, and a calcined-lime constituent according to claim 3 or 4.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the calcined-lime constituent of the raw material used for the method and it which manufacture the suitable slaked-lime coarse grain for the filler for having low specific surface area, for example, giving fire retardancy to plastics etc.

[0002]

[Description of the Prior Art] Slaked lime is known as a cheap inorganic filler for giving fire retardancy to plastics etc., and the outstanding slaked lime of dispersibility or a fluidity is demanded for such a use.

[0003] On the other hand, although it can be obtained by adding and digesting water to calcined lime (CaO), when massive calcined lime is generally digested, the slaked lime obtained is the impalpable powder of low specific surface area about 15-20m² / g, and dispersibility and a fluidity are low [slaked lime (calcium² (OH)) / slaked lime].

[0004] Generally depending on the particle size from which powdered dispersibility and a powdered fluidity constitute it, as for these properties, the one where a constituent particle is finer becomes bad. It is not easy to measure correctly the particle-size of the primary particle in the powder which constitutes powder and governs the aforementioned dispersibility and a fluidity on the other hand (particle which the small particle is condensing). Then, having specific surface area and considering as the aforementioned dispersibility or a fluid index generally, is performed. That is, the one where specific surface area is smaller has a large particle size, and dispersibility and the fluidity are excellent.

[0005]

[Problem(s) to be Solved by the Invention] When examining many things experimentally in view of the above-mentioned situation and digesting calcined lime under existence of a specific additive, this invention persons acquire the knowledge that the slaked lime which has low specific surface area, i.e., the specific surface area of under 15m²/g, can be obtained easily, and result in this invention.

[0006] That is, the purpose of this invention is to offer cheaply the outstanding slaked-lime powder of the dispersibility which offers the method of manufacturing the slaked lime of low specific surface area from calcined lime, for example, can be applied to a filler etc., and a fluidity.

[0007]

[Means for Solving the Problem] this invention is a calcined-lime constituent characterized by containing a specific additive, and, specifically, is a calcined-lime constituent containing the hydroxide of a monocarboxylic acid, amino acid, alkali metal, and/or alkaline earth metal and/or a carbonate, or a saccharose.

[0008] Furthermore, this invention is the manufacturing method of the slaked lime characterized by digesting calcined lime under existence of the aforementioned additive, and is the manufacturing method of the slaked lime characterized by digesting this, using the calcined-lime constituent containing the aforementioned specific additive as a raw material.

[0009]

[Embodiments of the Invention] The specific surface area which was not able to be obtained

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conventionally acquires the knowledge that the slaked lime which has the low specific surface area below $10\text{m}^2/\text{g}$ under $15\text{m}^2/\text{g}$, and under desirable conditions can be obtained easily, and this invention persons result in this invention, when examining many things experimentally for the purpose of obtaining the slaked lime of low specific surface area as above-mentioned and using a specific additive.

[0010] In this invention, it is essential, and digesting calcined lime under existence of a specific additive does not need to specify this about the addition sequence to the calcined lime of an additive, and the addition method, and it may distribute in the water which uses the aforementioned specific additive for digestion beforehand. Although the reason the specific surface area of the slaked lime obtained becomes remarkably low in a specific additive existing is unknown when digesting calcined lime, the calcium ion intensity in the liquid phase at the time of digestion(water) was raised, or diffusion of calcium ion became quick, and this invention persons have imagined it as that to which it is related that the digestive (hydration) reaction of calcined lime is promoted, when a specific additive exists.

[0011] As a result of repeating many experimental examination based on the above-mentioned idea, further, this invention persons find out that the hydroxide of a monocarboxylic acid, amino acid, alkali metal, and/or alkaline earth metal and/or a carbonate, and a saccharose are effective, and that especially the thing explained below into it is effective, and result at this invention.

[0012] That is, the 1st group of the additive of this invention is a monocarboxylic acid. As a monocarboxylic acid, oxy-monocarboxylic acids, such as monocarboxylic acids, such as a formic acid, an acetic acid, a propionic acid, butanoic acid, a valeric acid, and an acrylic acid, glucoheptonic acid, a gluconic acid, galactonic acid, an arabonic acid, the Ellis Ron acid, a glyceric acid, and a glycolic acid, are raised. Moreover, a monocarboxylic acid can be added as salts, such as alkali metal and alkaline earth metal, as a form of addition. Among these, since the slaked lime of low specific surface area tends to obtain a calcium salt, it is desirable.

[0013] The 2nd group of the additive of this invention is amino acid. As amino acid, amino acid, such as an alanine, an arginine, an asparagine, an aspartic acid, a cysteine, a cystine, glutamic acid, a glutamine, a glycine, a histidine, a hydroxylysine, a hydroxyproline, an isoleucine, a leucine, a lysine, a methionine, a phenylalanine, a proline, a serine, a threonine, a tryptophan, a tyrosin, and a valine, and these salts are mentioned.

[0014] The 3rd group of the additive of this invention is the hydroxide and/or carbonate of alkali metal and/or alkaline earth metal. As a hydroxide of alkali metal and/or alkaline earth metal, a lithium hydroxide, a sodium hydroxide, a potassium hydroxide, a hydroxylation rubidium, a cesium hydroxide, hydroxylation beryllium, a magnesium hydroxide, a calcium hydroxide, a strontium hydroxide, a barium hydroxide, etc. are mentioned.

[0015] Moreover, as a carbonate of alkali metal and/or alkaline earth metal, a lithium carbonate, a sodium carbonate, potassium carbonate, a carbonic acid rubidium, a cesium carbonate, carbonic acid beryllium, a magnesium carbonate, a calcium carbonate, a strontium carbonate, a barium carbonate, etc. are mentioned.

[0016] A saccharose is mentioned as the 4th group of the additive of this invention.

[0017] In this invention, even if two or more sorts of matter classified into a different group as well as using simultaneously two or more sorts of matter in a group is used for the additive which carried out the group division at the 1st group, the 2nd group, the 3rd group, and the 4th group, it does not interfere.

[0018] In this invention, the optimal addition of an above-mentioned additive changes with the target specific-surface-area value of the slaked lime which it is going to obtain, molecular weight of the matter which constitutes an additive, etc. Usually, it is 0.1 - 10 % of the weight to a total of 100 % of the weight of calcined lime and an additive, and is 1 - 6 % of the weight preferably. At less than 0.1 % of the weight, it is a book. The aforementioned desirable range is chosen in consideration of both sides.

[0019] Next, how to digest this is explained to an example about the conditions of the digestion in this invention using the calcined lime which added the aforementioned additive beforehand.

[0020] The calcined lime which carried out dry grinding of the limestone with the ball mill etc.

after heat-treatment by rotary kiln, the Beckenbach kiln, etc., was classified in various sizes as calcined lime, and was obtained can be used, for example, 0.1 - 10% of the weight of an additive is conventionally mixed by dry-blending in a plane, such as a ribbon blender and a Henschel mixer, to this using the well-known thing whose specific surface area a mean particle diameter is about 4 micrometers, and is $4\text{m}^2/\text{g}$ grade, and a calcined-lime constituent is obtained.

[0021] Next, although water is added and digested to the aforementioned calcined-lime constituent, the rate-of the calcined-lime constituent at this time and water has the desirable weight ratio of $1/0.35$ - $1/1.5$; and, as for temperature, it is desirable to hold to abbreviation regularity in 40-70 degrees C. Moreover, since the mixture of the aforementioned calcined-lime constituent and water shows the powder state carried out slurry-regime - humidity according to the combination condition, a digestive lead condition, etc., the mixer according to it is used for it until a digestive reaction is completed.

[0022] Furthermore, since the slaked lime which finishes a digestive reaction and is obtained usually contains unreacted water, although it dries and it is evaporated, powder condenses it at this time and it has a bird clapper as it is massive. For this reason, although it is common after dryness to carry out dry grinding, it is desirable to perform the aforementioned dryness and operation of trituration simultaneously.

[0023] Hereafter, based on an example and the example of comparison, this invention is explained still in detail.

[0024]

[Example] [Example 1] To the calcined-lime ("calcined lime" by DENKI KAGAKU KOGYO K.K.) 100 weight section of specific surface area of $4.0\text{m}^2/\text{g}$, the calcium acetate was mixed by dry type using 6 weight ***** and the mortar, and the calcined-lime constituent was obtained.

[0025] The water 100 weight section was added to the aforementioned calcined-lime constituent 106 weight section, it held at 60 degrees C for 1 hour, and the digestive reaction was made to complete. Churning was performed during this digestive reaction. It cracked, after heating the obtained slaked lime at 120 degrees C and drying, and slaked-lime powder was obtained.

[0026] About the aforementioned slaked-lime powder, when specific surface area was measured by the BET adsorption method, the low specific-surface-area value $3\text{m}^2/\text{g}$ was shown. This result is shown in Table 1.

[0027]

[Table 1]

	添加剤の種類	添加量 重量部	消石灰の比表面積 m^2/g
実施例 1	酢酸カルシウム	6	3
2	グルコン酸ナトリウム	6	9
3	塩化カルシウム	6	5
4	水酸化ナトリウム	6	4
5	炭酸ナトリウム	6	1 2
6	サッカロース	6	9
比較例	—	—	2 2

[0028] [Examples 2-6] It changed into the calcium acetate of an example 1, and except having used various additives, the same operation as an example 1 was performed, various slaked-lime powder was obtained, and those specific-surface-area values were measured. This result is shown in Table 1.

[0029] [Example of comparison] If it removed having not used a calcium acetate, specific surface area was measured about the slaked-lime powder which obtained by carrying out the same operation as an example 1. This result is shown in Table 1.

[0030]

[Effect of the Invention] According to this invention, the slaked-lime powder which has the outstanding low specific-surface-area value of dispersibility and a fluidity applicable to the filler of plastics etc. can be offered cheaply.

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